# A revision of *Platylobium* (Fabaceae: Bossiaeeae)

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## Abstract

A revision of the Australian-endemic genus *Platylobium* Sm. (Fabaceae: Bossiaeeae) is presented. Four new species are described: *P. rotundum* I.Thomps., *P. infecundum* I.Thomps., *P. montanum* I.Thomps., and *P. reflexum* I.Thomps., all segregated from *P. formosum* Sm. *Platylobium parviflorum* Sm. is returned to species rank. A new subspecies, *P. montanum* subsp. *prostratum* I.Thomps., is also described. Keys to species and distribution maps are presented.

***Keywords***: morphology, taxonomy, biodiversity, flowering plants, peas, legumes.

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## Introduction

*Platylobium* Sm. is a small genus of shrubs in the Australian-endemic tribe Bossiaeeae (Fabaceae). It is distinguished from the other six genera in the tribe by the combination of distichous phyllotaxy, unifoliolate leaves with a relatively large leaflet, several scales subtending single-flowered inflorescences, massively expanded and rounded upper calyx-lobes, and flat, thinly winged pods. *Platylobium* occurs in areas of moderate to high rainfall in south-eastern Australia with the greatest diversity in Victoria. It is closely related to the much larger genus *Bossiaea* Vent. which possesses many of the features described above, but does not have pods with a thinly winged upper suture. The other genera in the tribe, *Goodia* Salisb., *Paragoodia* I.Thomps. (Thompson 2011), *Muelleranthus* Hutch., *Ptychosema* Benth., and *Aenictophyton* A.T.Lee, all differ in most respects to the combination of features given above.

*Taxonomic History*: The genus and two species, *Platylobium formosum* Sm. and *P. parviflorum* Sm., were described in 1793, followed by *P. triangulare* R.Br. in 1812 and *P. obtusangulum* Hook. in 1833. The number of species recognised was reduced to three when Bentham (1864) treated *P. parviflorum* as a variety of *P. formosum*. *Platylobium alternifolium* F.Muell. was described in 1883. Over the next 100 years the only taxonomic change was a change of status of *P. formosum* var. *parviflorum* (Sm.) Benth. to subspecies rank. More recently, Ross (1983) produced a revision of the genus in which no changes were made except for the loss of status of *P. parviflorum*. Thus, as this study commenced, four species of *Platylobium* were recognised in Australia. In New South Wales, *P. formosum* subsp. *parviflorum* (Sm.) A.T.Lee continued to be recognised, most recently by James (2002).

## Methods

This morphological study utilised herbarium material predominantly, which was examined with the aid of a dissecting microscope. Pressed flowers were reconstituted using hot soapy water to facilitate examination. Specimens from AD, BRI, CANB, HO, MEL and NSW were examined. Field examination and collection at numerous locations in Victoria and New South Wales also contributed to the author's

understanding of the genus. All images presented were taken by the author using a Canon PowerShot A2000 IS digital camera.

## Results

The results of this morphological study are presented in the taxonomic section below. In summary, the pattern of morphological variation identified calls for the recognition of four new species and one new subspecies, as well as the return of *P. parviflorum* to the rank of species. All new taxa are segregated from *P. formosum* as circumscribed by Ross (1983). The circumscriptions of *P. triangulare*, *P. obtusangulum* and *P. alternifolium* are unchanged.

The more important taxonomically useful characters recognised for *Platylobium* in this study include: habit; fertility; distribution and density of indumentum; phyllotaxis; length of petiole and the distinctness of the petiole-petiolule articulation; leaflet shape; length of pedicels; length, shape, colour, texture and recurvature of bracteoles; length of pod-stipe; and width of wings of pods.

## Taxonomy

***Platylobium* Sm., *Spec. Bot. New Holland* 1: 17, t. 6 (1793)**

***Type*: *P. formosum* Sm.**

*Shrubs or subshrubs*, erect, climbing, sprawling or prostrate, to c. 2 m high, sometimes slightly glaucous. *Indumentum* of simple hairs scattered on branches, leaves, pedicels, calyces and pods, and less commonly on stipules, scales, bracts and bracteoles; branches and leaves often glabrescent; hairs 0.5–1.5 mm long, spreading or antrorse-appressed. *Stipules* triangular-ovate to triangular-lanceolate, often becoming deflexed, scaly, striate, brown, gradually eroding; scales developed instead of leaves and stipules at and towards the base of floral and vegetative axes. *Leaves* distichous, opposite or alternate, unifoliolate, inserted on prominent branch flanges; petiole pulvinate; petiole-petiolule articulation conspicuous or indistinct; petiolule short, pulvinate; lamina triangular, ovate or orbicular, sometimes with acute to obtuse baso-lateral angles or lobes which are often pungent, coriaceous, with conspicuous reticulate venation, commonly glabrescent but with hair-bases commonly persisting as minute tubercles; base deeply cordate to broad-cuneate; apex rounded to acute, apiculate, with apiculum sometimes pungent. *Inflorescences* arising from axils of short lateral branches or towards termini of longer branches, with 1–4 inflorescences per axil; each inflorescence comprising 1, or very rarely 2, pedicellate flowers subtended by 4–16 scales; scales generally crowded, brown, chartaceous, sometimes striate, ciliate marginally, increasing in length successively; bract and bracteoles similar in appearance to scales, persistent; bracteoles opposite or sub-opposite, ovate to lanceolate, mostly inserted strongly distally on pedicel; receptacle c. 0.5 mm long. *Calyx* 5–12 mm long, with tube 1.5–3 mm long; upper lobes much longer than tube, much broader and longer than lower lobes, almost free, dilating distally, with apex rounded; lateral angle not or hardly evident; lower lobes triangular; petals clawed, with standard claw longest; standard slightly longer than wings and keel, with limb oblate, deeply emarginate; adaxial surface yellow or rarely orange with a red or pinkish flare around a yellow, red-flecked throat, abaxially purple-brown with variable bands of yellow at sides; wings obovate, straight to slightly downcurved, slightly longer than and mostly slightly narrower than keel, pure yellow or variously marked red; keel with apex rounded, with petals free, white basally, dark red towards apex; anthers uniform in size, all dorsifixed; ovary 3–8-ovulate; stigma capitate. *Pods* stipitate; body oblong, elliptic or rhomboidal, strongly compressed, with upper suture forming a thin wing; valves chartaceous, glabrous or sparsely to densely hairy, becoming revolute post-dehiscence. *Seeds* reniform or ellipsoid, ±plump, brown or black, sometimes mottled; aril one-third to one half of length of seed, with base elliptic, open at one end, and with a large, arching vertical lobe arising from the closed end.

***Notes on morphology*: LEAVES**: Figure 1a shows some of the more significant aspects of variation seen in the shape of the lamina of the terminal leaflet. There is moderate variation in shape within each species, so these examples, although typical, are a guide only for the species shown. Figure 5 shows a further variation, the near-circular lamina commonly seen in *P. rotundum*.

**PETIOLE-PETIOLULE ARTICULATION**: Figures 1b and 1c shows an important aspect of leaf morphology

in *Platylobium* which can be used to distinguish *P. triangulare*, *P. formosum* and *P. parviflorum*, from the other six species in the genus. In these three species there is no clear articulation evident between petiole and petiolule. Instead, an apparently single pulvinate structure curves between branch and leaflet-lamina, and so the leaf appears to be simple rather than unifoliolate. In the other six species, in contrast, there is a distinct articulation which is detectable by either a ridge, an obtuse angle, or by the different thicknesses of the petiole and the petiolule. Often two or all of these elements contribute together. In *P. reflexum* and *P. obtusangulum*, which have short petioles, inspection at low magnification will be necessary to identify a ridge or angularity. Similar variation in the morphology of the petiole-petiolule articulation occurs in the closely related genus *Bossiaea*, and in this genus too it can aid in distinguishing species.

**SCALES**: Clusters of several strongly overlapping bud scales (hereafter scales) persist at or near the base of both vegetative and inflorescence branches. Scales are formed by the fusion of a pair of stipules. There is a progressive increase in the size of the scales from the base of the axis. For vegetative axes, there are commonly

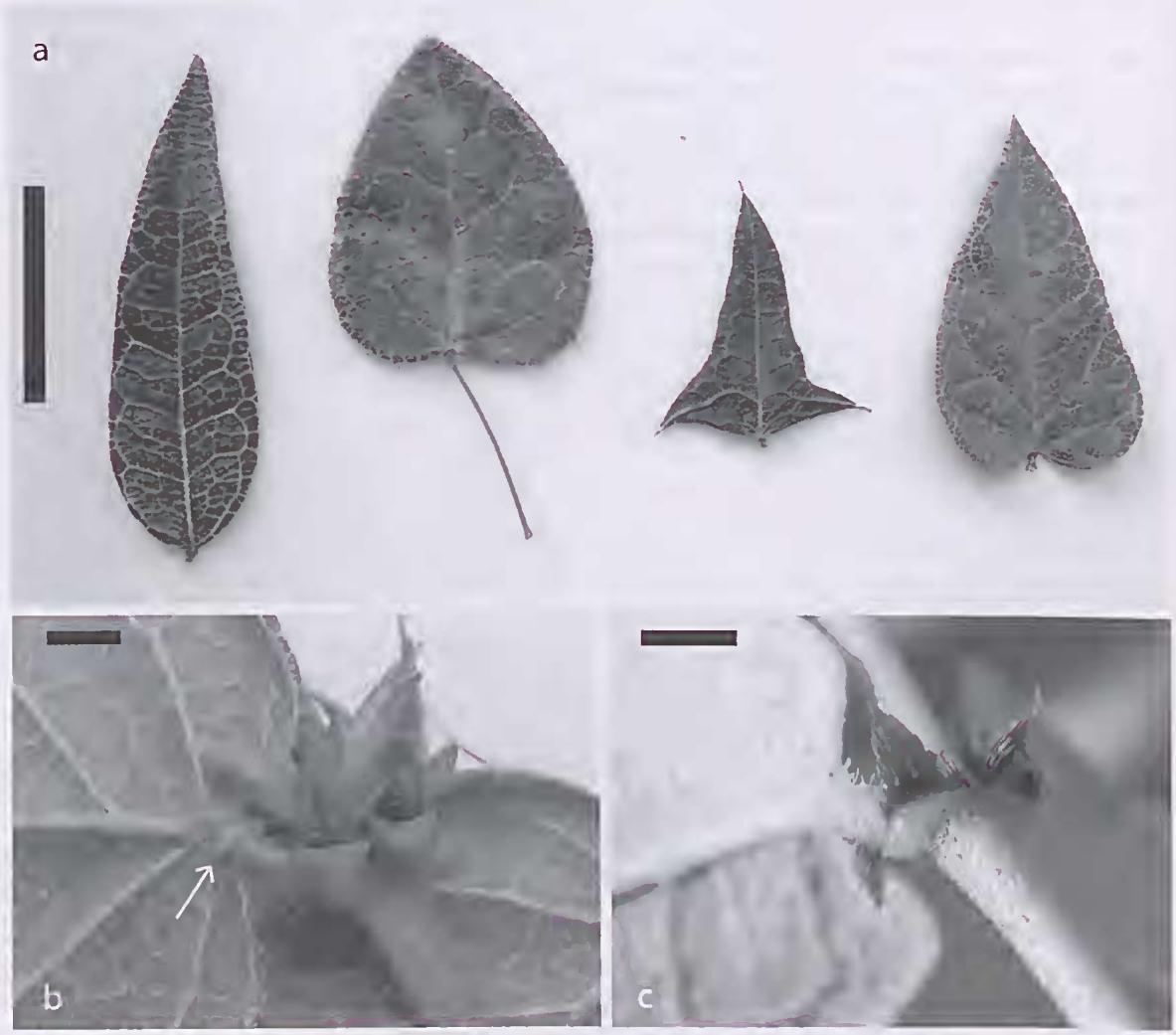


**Figure 1.** Leaves. a. Leaflet-lamina, examples. From l to r: *P. parviflorum*, *P. infecundum*, *P. obtusangulum*, *P. montanum* (*IRT 1214* MEL, *IRT 1104* MEL, *IRT 1141* MEL, and *IRT 1216* MEL respectively). b. & c. Petiole-petiolule articulation. b. *P. reflexum*, ridge indicating articulation indicated by arrow. Insertion of petiole onto branch is hidden by stipule (*IRT s.n., Aug. 2009*, MEL), c. *P. parviflorum*, articulation obscure (*IRT 1137* MEL). IRT = Ian R. Thompson. Scale bars: a–b = 10 mm, c–d = 2 mm.

a few to several alternately arranged scales inserted along the axis, distal to the overlapping cluster of scales, before the first leaf is produced at a node, and bifid scales (partly fused stipules), occasionally occur in this region. Sometimes the majority of scales are scattered along an axis rather than crowded basally.

**BRACTS AND BRACTEOLES**: Bracts and bracteoles are more or less identical to scales morphologically but are slightly larger. In fresh specimens, notably in *P. montanum*, they are sometimes still slightly green and glaucous at anthesis. In this paper, unlike in Ross (1983), the pedicel is defined as extending from the insertion point of the distalmost scale to the receptacle. The bract is inserted at the base of the pedicel and therefore is strongly overlapped by at least the distalmost scale. In descriptions below, the bract and scales together is called the scale-bract cluster. Bracteoles are mostly inserted distally on the pedicel and are therefore generally clearly separated from the cluster. In *P. obtusangulum* the separation is less and the bract overlaps the bracteoles. Examples of scale, bract and bracteole arrangements are shown in figures 2 and 4. Usually the axis on which scales are inserted is very short; however, in *P. alternifolium*, and occasionally in other species, notably *P. montanum*, the branch is more elongate and scales more widely spaced.

**FLOWERS**: Figure 2c and 2d show abaxial and adaxial views of the standard petal. Although the

**Key to species of *Platylobium***

1 Leaves all alternate ..... 2

1: At least some leaves opposite ..... 3

2 Calyx glabrous externally (margins ciliolate); pedicels (bract to receptacle) 3–6 mm long; leaflet-lamina ovate with base mostly cordate ..... ***9. P. alternifolium***

2: Calyx hairy externally; pedicels mostly 20–50 mm long; leaflet-lamina commonly c. broad-ovate to c. circular, with base mostly rounded ..... ***8. P. rotundum***

3 Petiole-petiolule articulation obscure in all or most leaves (ie. leaves appear simple) ..... 4

3: Petiole-petiolule articulation distinct (geniculate and/or with ridge development) in all or most leaves (ie leaves are clearly unifoliolate) ..... 6

4 Leaves somewhat triangular, and at least some with baso-lateral points; standard and wings orange-yellow ..... ***2. P. triangulare***

4: Leaves ovate to lanceolate, without baso-lateral points; standard and wings bright yellow ..... 5

5 Calyx (7.5–)8–12 mm long; bracteoles < half of length of calyx; scales, bracts and bracteoles ±evenly hairy abaxially; pod-wings 3–5.5 mm wide ..... ***3. P. formosum***

5: Calyx 5–8 mm long; bracteoles > half of length of calyx; scales and bract glabrous abaxially or with only a few midline hairs (bracteoles glabrous or hairy); pod-wings 1.5–3.5 mm wide ..... ***4. P. parviflorum***

6 Pedicel not exceeding bract; calyx 8–12 mm long; stipe of pods 1–2 mm long; leaves often with acute to obtuse baso-lateral angles and these often pungent ..... ***1. P. obtusangulum***

6: Pedicel generally clearly exceeding bract, or if not then calyx < 7 mm long; stipe of pods 5–15 mm long; leaves rounded baso-laterally ..... 7

7 Bracteoles convex throughout, not becoming reflexed (or slightly reflexed at tip only), smooth, or slightly striate, brown to reddish-brown ..... ***5. P. montanum***

7: Bracteoles nearly flat in distal half, mostly becoming reflexed, orange-brown, markedly striate ..... 8

8 Petioles predominantly < 5 mm long; plants becoming weakly erect, to c. 1 m high (or higher if supported by vegetation); plants generally fertile ..... ***6. P. reflexum***

8: Petioles frequently 5–20 mm long; plants prostrate; plants generally infertile ..... ***7. P. infecundum***


**Figure 2.** a. *P. reflexum*, cluster of inflorescences (*IRT 1100* MEL), b. *P. formosum*, flowering branch, showing hairy scales (*IRT 1201* MEL), c. *P. obtusangulum*, flower shortly before opening (*IRT 1094* MEL), d. *P. infecundum*, flower (*IRT 1104* MEL), e. *P. formosum*, pod, persistent calyx and bracteoles (*IRT 1201* MEL), f. *P. montanum* subsp. *montanum*, fruit (*IRT 1216* MEL), g. *P. parviflorum*, inside of pod valve after dehiscence (*IRT 1214* MEL), h. *P. reflexum*, seed (*IRT 1132* MEL). IRT = Ian R. Thompson. Scale bars: a, c-d = 5 mm, b = 2 mm, e–g = 10 mm, h. Seed is 2.8 mm long.

images are from different species, the presence of extensive marking of the abaxial surface occurs in all species. The red to purplish (drying dark grey often) markings sometimes do not extend all the way to the lateral margins of the standard leaving a yellow band on each side. The markings are perhaps least extensive in *P. parviflorum* and *P. formosum*.

A distinctive feature of *Platylobium* is the large size difference between upper and lower lobes of the calyx. This is demonstrated in figures 2e and 2f which show fruit with a persistent calyx.

Detailed illustrations of *Platylobium* are presented in Ross (1983). Figures 2 and 4 in this paper show useful illustrations of *P. alternifolium*, *P. obtusangulum* and *P. triangulare*, while Figure 6 shows some of the variation in *P. formosum sensu* Ross (1983). Based on the taxonomic changes made herein, the new names for the elements in Figure 6 are as follows: a. & b. shows *P. montanum* subsp. *montanum*, c. & d. shows *P. parviflorum*, and e. shows *P. montanum* subsp. *prostratum*.

### 1. *Platylobium obtusangulum* Hook., in W.J.Hooker (ed.) *Curtis's Bot. Mag.* 60: t. 3258 (1833)

***Type***: Iconotype t. 3258, *loc. cit.*

*P. macrocalyx* Meisn., *in* J.G.C.Lehmann, *Pl. Preiss.* 1: 80 (1844). *Type*: Victoria. Port Phillip, *C. Latrobe*, 1842; lectotype: NEU, *fide* J.H.Ross, *Muelleria* 5(2): 134 (1983).

*P. obtusangulum* var. *spinulosum* J.H.Willis, *Muelleria* 1: 126 (1967). *Type*: Victoria. On Aireys Inlet to Wensleydale Road, ± 3.2 km N of Forestry Tower at Peter's Hill, *M.Allender*, 12.xi.1961; holotype: MEL1522466.

[*P. triangulare auct. non* R.Br. (1812): Sims, *Bot. Mag.* t. 1508 (1812); J.D.Hooker, *Fl.Tasman.* 1: 96 (1856)]

*Erect to sprawling shrubs*, to c. 1 m high. *Stipules* 2–3 mm long, 1–1.5 mm wide. *Leaves* opposite; petiole 0.5–2(–4) mm long; petiole-petiolule articulation mostly distinct; lamina ovate to narrow-ovate, c. triangular, or trilobate, occasionally c. circular, rarely lanceolate, 10–30 mm long, 5–25 mm wide with l:w ratio mostly 1–2, rarely to c. 5; baso-lateral angles or lobes common, often with pungent points; base broad-cuneate, truncate, cordate, or sagittate; margin flat to recurved; apex acute to very acute with a pungent apiculum 0.5–3 mm long; upper surface often tuberculate, secondary veins ± spreading at widest part of leaf, often arching backwards; lower surface often with a persistent pubescence; midrib to c. 0.5 mm wide. *Inflorescences* 1–3 per axil; scales 6–14, glabrous or with hairs in midline and/or near apex; scale-bract cluster 6–10 mm long; bract 4–8 mm long; pedicel 3–8 mm long; bracteoles inserted immediately below receptacle, 5–10 mm long, 3–5 mm wide, strongly convex throughout, not becoming reflexed, weakly striate, glabrous or with hairs medially and distally, orange-brown. *Calyx* 8–12 mm long, with a moderately dense indumentum of loosely appressed hairs; upper lobes 6–10 mm long, 4–8 mm wide, with sinus 5–8 mm deep, lower lobes 2–3 mm long; standard 10–14 mm long, 12–18 mm wide, with claw c. 3 mm long; abaxial surface red grading to purple-brown ±throughout; wings 9–12 mm long, 3–3.5 mm wide, red proximally or almost throughout; keel 8–11 mm long, c. 4 mm wide; style 4–6 mm long. *Pods*: stipe c. 1 mm long; body 10–25 mm long, 10–15 mm wide, including wing 2–4 mm wide, mid-brown, commonly 4 or more-seeded; sutures hairy, valves glabrous or with scattered hairs, hairs longer in zone overlying seed; funicles c. 1 mm long. *Seeds* 2.5–3 mm long, 1.8–2 mm wide, brown; aril 1.5–2 mm long, c. 1 mm high, with base 1–1.5 mm long; lobe slightly overhanging base.

***Selected specimens of over 400 examined***: **SOUTH AUSTRALIA**: E of Mt Lofty summit, *R.Bates 658*, iv.1980 (AD); Head of Sou' West R., c. 75 km WSW of Kingscote, *J.B.Cleland*, 27.xi.1924 (AD); Crompton's Scrub, c. 15 km WSW of Victor Harbour, *D.Hunt 3330* (AD); Lenswood Research Centre, c. 20 km ENE of Adelaide, *H. van Dam 232*, 28.ix.1969 (AD). **VICTORIA**: Beside Western Hwy, S of Mt Langi Ghiran, *I.C.Clarke 1985*, 11.x.1989 (CANB, MEL1582873, NSW); Halls Gap to Roses Gap Rd, *T.Henshall*, 5.xi.1967 (MEL721797); Victoria Valley, near junction of Syphon Rd and Serra Rd, *M.G.Corrick 10254*, 1.xi.1987 (CANB, MEL1575689); Yanakie-Black Swamp Rd junction, *A.Worz*, 29.x.1992 (MEL2070995); Bordman's Track, c. 3 km W of Mt Anakie, *R.V.Smith 59/235*, 25.ix.1959 (AD, MEL1534389); c. 1 km from Fernbank Rd in railway reserve, S of railway line, *R.J.Fletcher 301*, 4.xi.1994 (MEL2023586); Rockbeare Park, Ivanhoe, *R.V.Smith 87/2*, 13.xi.1987 (AD, CANB, HO, MEL2034294, NSW); c. 7 km N of Anglesea, along Gum Flat Rd, *H.I.Aston 354*, 15.x.1959 (MEL721799). **TASMANIA**: E side of Rocky Cape National Park, *A.C.Rozefelds 1869*, 28.ix.2000 (HO); Near Freestone Hill, c. 20 km N of Swansea, *A.M.Buchanan 4808*, 11.xii.1984 (HO); W side of Chinese Ck, Schouten Island, *A.C.Rozefelds 1924*, 14.xi.2000 (HO); Cambridge, *A.V.Giblin*, 23.x.1929 (HO); Launceston, *Hannaford 821*, x.1863 (MEL572082).

***Flowering period***: Flowers spring.

***Distribution and habitat***: Occurs in far south-eastern South Australia, southern Victoria, and Tasmania (Fig. 3). A specimen with a label indicating Darling Range, Western Australia (*Lucas* NSW 42987) is *P. obtusangulum*; however, the locality is highly unlikely and the specimen is therefore deemed incorrectly labelled. Grows in various soils in forest and heathland.

***Notes***: *Platylobium obtusangulum* shows considerable variation in leaf morphology, but is relatively uniform in other characters. When sterile, it can be distinguished from *P. triangulare*, a species with similar angular leaves, by examining the petiole-petiolule articulation. In *P. obtusangulum* the petiole is distinctly ridged at the articulation and the articulation is often geniculate (as in figure 1b showing *P. reflexum* but with a shorter petiole); in *P. triangulare* the articulation is not evident, ie. the leaves appear to be simple rather than unifoliolate (as in figure 1c showing *P. parviflorum*).

One extreme variant with leaves bearing additional lobes and spines was described by Willis (1967) as *P. obtusangulum* var. *spinulosum* Willis based on plants collected from near Anglesea in south-central Victoria. This variety was not recognised by Ross (1983) and is not recognised here. Specimens with the same leaf morphology have been recorded in recent decades from the Southern Lofty region of South Australia, e.g. Newland Head Conservation Park (*R.Taylor s.n.* AD) and Mt Lofty summit (*R.Bates 658* AD), and from Melbourne (*P.Raufer s.n.* MEL) and Gippsland (*R.Fletcher 301* MEL) in southern Victoria. In all cases, the typical leaf forms of *P. obtusangulum* occur in the same area.

***Hybrids***: Hybridisation between *P. obtusangulum* and *P. triangulare* has been recorded from Wilsons Promontory (*M.G.Corrick 7069* MEL & *M.G.Corrick 7072* AD, MEL, NSW) and from Rocky Cape National Park, Tasmania (*M.Wapstra s.n.*, 10.xii.2008 MEL).

## 2. *Platylobium triangulare* R.Br., in W.T.Aiton, *Hortus Kew*. edn 2, 4: 266 (1812)

***Type***: Tasmania. King Island, *R.Brown*, 23.iv.1802; lectotype: BM, *fide* J.H.Ross, *Muelleria* 5(2): 131 (1983), image MEL.

*P. murrayanum* Hook., *in* W.J.Hooker (ed.), *Curtis's Bot. Mag.* 60: t. 3259 (1833). *Type*: Iconotype, *loc. cit.* [Drawn from a cultivated plant grown from seed collected in Tasmania.]

*Weakly erect to sprawling shrubs*, to c. 0.5 m high. *Stipules* 1–2 mm long, c. 1 mm wide. *Leaves* opposite; petiole 0.5–1 mm long; petiole-petiolule articulation generally obscure; lamina triangular or triangular-ovate, 10–30 mm long, 7–22 mm wide, with l:w ratio mostly 1–2; acute baso-lateral angles developed on all or a proportion of leaves, angles often with pungent points; base truncate, cordate or sometimes sagittate; margin recurved; apex acute with a pungent apiculum 0.5–2.5 mm long; upper surface sometimes tuberculate, secondary veins c. spreading at widest part of leaf, sometimes arching back; lower surface usually glabrescent; midrib to c. 0.4 mm wide. *Inflorescences* 1 or 2 per axil; scales 6–8, glabrous; scale-bract cluster 2–4 mm long; bract 2–2.5 mm long; pedicel 5–12 mm long; bracteoles inserted 1–3 mm below receptacle, 1.5–3 mm long, 1–2 mm wide, flat, commonly reflexed, distinctly striate, glabrous or with a few midline hairs, reddish. *Calyx* 7–11 mm long, with a scattered indumentum of loosely appressed hairs; upper lobes 5–9 mm long, 4–7 mm wide; lower lobes 1.5–2.5 mm long; standard 10–12 mm long, 12–18 mm wide, with claw 3–4 mm long, adaxial surface orange with flare pinkish-red; abaxial surface purple-brown ±throughout; wings 9–12 mm long, 4–5 mm wide, with pinkish-red markings proximally; keel 8–10 mm long, 4–5 mm wide; style 3–4 mm long. *Pods*: stipe 2–7 mm long; body (15–)20–30 mm long, 11–18 mm wide including wing 2–3 mm wide, light brown, up to 8-seeded; sutures hairy, valves glabrous; funicles c. 1 mm long. *Seeds* c. 3 mm long, c. 2 mm wide, brown; aril 1.5 mm long, 1 mm high, with base 1.3 mm long; lobe overhanging base.

***Selected specimens of c. 40 examined***: **VICTORIA**: Behind beach, Waterloo Bay, *M.G.Corrick 7078*, 6.xi.1980 (MEL576042); Heath Road, just past Pipeclay ext., Lower Glenelg National Park, *R.J.Fletcher 190*, 17.ix.1993 .(MEL2018043); Orford, *H.B.Williamson*, x.1899 (MEL584533); Tullich Rd, c. 12 km E of Casterton, *M.G.Corrick 8483*, 1.xi.1982 (MEL641465); Along the main Portland–Nelson Rd, c. 5 km SE of Gorae West, *H.I.Aston 726*, 22.x.1960 (MEL570858); McCraes Rd, W of Portland, *C.& D.Woolcock 1395*, 10.xii.1983 (MEL654694); Near Mt Richmond, 29 km from Portland towards Nelson, *M.E.Phillips 266*, 28.x.1971 (CANB). **TASMANIA**: Beach end N of Bicheno, *H.D.Gordon*,

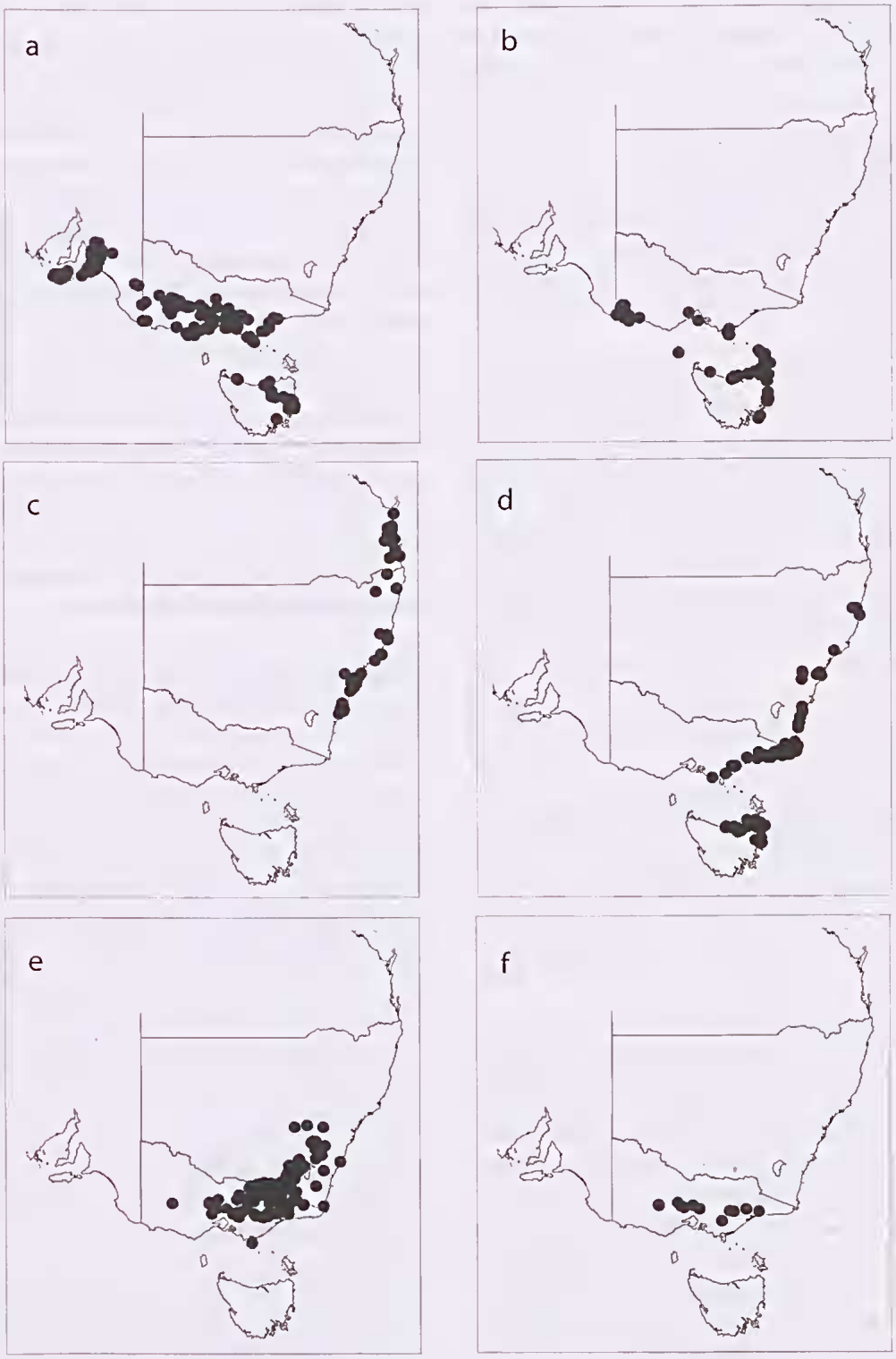


**Figure 3.** Distributions of a. *Platylobium obtusangulum*, b. *P. triangulare*, c. *P. formosum*, d. *P. parviflorum*, e. *P. montanum* subsp. *montanum* and f. *P. montanum* subsp. *prostratum*.

18.xi.1942 (HO); Cape Barren Island, *P.Cullen*, xii.1989 (HO); St Helens, *W.M.Curtis*, x.1945 (HO); Mt Cameron, *A.Moscal 377B*, 23.x.1983 (HO); Bridport, *P.Collier 2647*, 29.viii.1986 (HO); Mt Killiecrankie, Furneaux Group, *J.S.Whinroy 2587*, 23.ix.1978 (CAN8).

***Flowering period***: Flowers spring.

***Distribution and habitat***: Occurs in far south-western Victoria, Wilsons Promontory in south-central Victoria, and in northern and eastern Tasmania, including King Island and the Furneaux Group of islands in Bass Strait (Fig. 3). Grows in heath, woodland and forest, commonly in sandy soils.

***Notes***: *Platylobium triangulare* is readily distinguished by its floral features, and from most other species by its leaf shape. In the absence of reproductive structures it can be distinguished from *P. obtusangulum* q.v., which has similarly shaped leaflet-laminas by examination of the petiole. As discussed in the notes under the generic description, in *P. triangulare* the petiole-petiolule articulation is obscure (see Figure 1c which shows *P. parviflorum*). In *P. obtusangulum* a ridge and sometimes the formation of an angle indicates the position of articulation.

*Platylobium triangulare* hybridises with *P. obtusangulum* q.v.

### 3. *Platylobium formosum* Sm., *Spec. Bot. New Holland* 1:18 (1793)

*P. formosum* var. *typicum* Domin., *Biblioth. Bot.* 89: 728 (1925).

***Type***: New South Wales. Location unknown, *J.White*, 1793 [sheet 1188.1]; lectotype: LINN, *fide* J.H.Ross, *Muelleria* 5(2): 136 (1983).

*Erect shrubs*, to c. 1.5 m high. *Stipules* 2–5 mm long, 1–1.5 mm wide. *Leaves* opposite; petiole 1.5–2.5 mm long; petiole-petiolule articulation generally obscure; lamina ovate to narrow-ovate or elliptic, 30–50 mm long, 15–40 mm wide, with l:w ratio mostly 1.2–2.2; baso-lateral points not developed; base rounded to cordate, uncommonly cuneate; margin recurved to slightly revolute; apex subacute or acute, with apiculum to c. 1 mm long, mostly withered, brittle; upper surface mostly not or only sparingly tuberculate except on veins, secondary veins angled gently forwards (15–30°) at widest part of leaf; lower surface glabrescent; midrib c. 0.6 mm wide. *Inflorescences* 1 or less often 2 per axil; scales 4–6, hairy all over; scale-bract cluster 3–4 mm long; bract 2–3 mm long; pedicel 3–12 mm long; bracteoles inserted immediately below receptacle, 3–4 mm long, 2–3 mm wide, ± flat in distal half, often becoming reflexed, distinctly striate, hairy all over, red-brown. *Calyx* (7.5–)8–12 mm long, with a sparse to moderately dense indumentum of loosely appressed hairs; upper lobes 5.5–9 mm long, 4–5 mm wide; lower lobes 2–3 mm long; standard 15–20 mm long, 18–25 mm wide, with claw 3–4 mm long; abaxial surface purple-brown with yellow bands at sides; wings 12–14 mm long, 4.5–6 mm wide, yellow throughout; keel 9–13 mm long, 5–7 mm wide, style 4–5 mm long. *Pods*: stipe 5–10 mm long; body 25–45 mm long, 15–20 mm wide including wing 3–5.5 mm wide, mostly mid-brown, mostly 4–8-seeded; sutures hairy, valves with hairs restricted to zone overlying seeds; funicles 1.5–2 mm long. *Seeds* 3–3.5 mm long, c. 2 mm wide, mid or dark brown; aril 1.5–2 mm long, c. 1 mm high, with base 1.5–1.8 mm long; lobe very slightly overhanging base.

***Selected specimens of c. 80 examined***: **QUEENSLAND**: 1.5 km NW of Caloundra, *J.H.Ross 313B*, 24.viii.1986 (AD, BRI, CAN8, HO, MEL, NSW); Oakey Creek Rd, SF 1239, NW of Mapleton, *A.R.Bean 10735*, 13.ix.1996 (BRI); Prout Rd, Burbank, *G.Leiper*, ix.2001 (BRI); Mt Cooroora, 1 km SW of Pomona, *I.R.Telford 3426*, 2.x.1973 (CAN8, MEL, NSW). **NEW SOUTH WALES**: Cowan Quarry, near Cowan, *G.Corsini 62*, 11.xii.1996 (CAN8); 1.7 km W of Tomerong, on Turpentine Rd, towards Sassafras, *T.R.Lolly and B.Lofoy 471*, 7.xii.1994 (CANB); NE border of Crowdy Bay National Park, Tahlee, Port Stephens, *E.F.Constable s.n.*, 23.x.1956 (NSW); Range Road, Tabbimoble SF, N of Grafton, *A.R.Bean 17940*, 15.ix.2001 (BRI); Princes Hwy, S side of Currumbene Creek, 20 m W of bridge, *F.E.Dovies 142, B.Hodlow & R.Hart*, 3.xii.1986 (CAN8, MEL); 1.8 km along Forest Rd towards Currawong. Turnoff is 8 km S of Nowra, *P.C.Jobson 377B*, 18.ix.1995 (MEL); E side of Myall Lakes Rd, 2.6 km S of Seal Rocks, *P.C.Jobson 5577 & C.C.Simpson*, 14.ix.1998 (MEL, NSW); 1.5 km N of Colo Heights, *M.Tindale*, 28.xi.1959 (NSW); Manly-Warringah War Memorial Park, Sydney, *D.Gibbons*, 20.x.1986 (NSW); Jervis Bay (Australian Commonwealth Territory), *E.Gaubo 1362*, 16.ix.1951 (CANB, NSW).

***Flowering period***: Flowers late winter to spring.

***Distribution and habitat***: Occurs in near coastal areas of south-eastern Queensland, south of Maryborough, and in New South Wales where it extends from the far north as far south as Jervis Bay (Fig. 3). Grows on sandstone in forest and heathland.

***Notes***: Rather than a polymorphic species as previously described, *Platylobium formosum* as newly circumscribed, is relatively uniform morphologically, and is characterised by large flowers, in particular a large calyx, hairy scales, bracts and bracteoles, and widely-winged pods. From *P. parviflorum*, probably its closest relative, it further differs in having leaves, on average, with a lower length:width ratio. Pods usually also differ in having a band of long hairs on the valves overlying the seeds. This pattern is rare in *P. parviflorum*. Scale and pod morphology are shown in figures 2b & e respectively. One duplicate of a collection from Cape Howe in far south-eastern New South Wales (*Constable 3277* MEL) is *P. formosum*. However, the other collection held at NSW is of *P. parviflorum*, the species you would expect to find at Cape Howe. The MEL specimen is considered highly unlikely to be from Cape Howe, and the record is not included here in the distribution map for *P. formosum*. The two species are probably sympatric at several places along the New South Wales coast, but there is no evidence of hybridisation except perhaps for a collection from Kelly's Falls near Helensburgh on the Central Coast (*Coveny 11272* NSW, MEL).

### 4. *Platylobium parviflorum* Sm., *Spec. Bot. New Holland* 1: 17, t.6 (1793)

*P. formosum* var. *parviflorum* (Sm.) Benth., *Fl. Austral.* 2: 154 (1864); *P. formosum* subsp. *parviflorum* (Sm.) A.T.Lee, *Contrib. New South Wales Natl. Herb.* 4: 96 (1970).

***Type***: New South Wales. Location unknown, *J.White*, 1793 [sheet 1188.3, no. 1]; lectotype: LINN, *fide* J.H.Ross, *Muelleria* 5(2): 136 (1983) *n.v.*, image seen MEL.

*P. ovatum* Sieber ex DC., *Prodr.* 2: 116 (1825), *nom. illeg. non* Andr. (1802). *Type*: New South Wales. Location unknown, *F.Sieber 374*, date unknown; holotype: G; isotype: CANB7801643, MEL571654, MEL571657, NSW564484.

*Erect shrubs*, to c. 2 m high. *Stipules* 3–6 mm long, 1–2.5 mm wide. *Leaves* opposite, or cataphylls and near basal leaves sometimes alternate; petiole mostly 1–2 mm long, occasionally to 4 mm long in lower leaves; petiole-petiolule articulation generally obscure, or occasionally proximal leaves have longer petioles and then articulation distinct; lamina narrow-ovate to lanceolate or narrow-elliptic, 20–60 mm long, 10–30 mm wide, with l:w ratio 1.5–4(–6); baso-lateral points not developed; base cuneate to broadly rounded, rarely slightly cordate; margin nearly flat to recurved; apex acute to narrowly acute with apiculum to c. 2 mm long, sometimes spine-like but non-pungent; upper surface sometimes minutely tuberculate, secondary veins angled forward at 10–30(–40)° at widest part of leaf; lower surface glabrescent; midrib c. 0.5 mm wide. *Inflorescences* 1–3 per axil; scales 8–12, glabrous or with a small patch of hairs; scale-bract cluster 3–5 mm long; bract 2.5–3.5 mm long; pedicel 5–15(–20) mm long; bracteoles inserted 1–2 mm below receptacle, 2.5–6 mm long, 1.5–3 mm wide, convex, not reflexing, mostly distinctly striate, glabrous or with a medial band of hairs or rarely hairy over most of surface, reddish-brown. *Calyx* 5–7 mm long, with a scattered indumentum of appressed hairs; upper lobes 3–5 mm long, 2.8–4 mm wide; lower lobes 1–2 mm long; standard 10–12 mm long, c. 15 mm wide, with claw c. 3 mm long; abaxial surface purple-brown with narrow to broad yellow zones at sides; wings 9–12 mm long, 4–5 mm wide, entirely or mostly yellow; keel 8–11 mm long, 4–5 mm wide; style 3–5 mm long. *Pods*: stipe 4–12 mm long; body 15–30 mm long, 12–14 mm wide including wing 1.2–3(–3.5) mm wide, mid-brown, mostly 4–8-seeded; sutures hairy; valves glabrous or hairy all over, or rarely with hairs overlying seeds only; funicles 1–1.5 mm long. *Seeds* 2.5–3 mm long, 1.6–2 mm wide, mid to dark brown, occasionally mottled; aril 1.5–2 mm long, c. 1 mm high, with base 1–1.2 mm long; lobe commonly overhanging base.

***Selected specimens of c. 100 examined***: **NEW SOUTH WALES**: 1.9 km from lighthouse toward Arakoon, Trial Bay, *J.Armstrong 8*, 25.viii.1972 (NSW); 8 km N of Bowraville, *C.Betteridge*, 28.viii.1971 (NSW); Carlotta Ave, Richmond Park, Gordon, *R.O.Makinson 49*, 8.ix.1985 (NSW); Wentworth Falls, i.1915 (NSW); Mt Solitary, 8 km S of Katoomba, *E.F.Constable s.n.*, 11.xi.1960 (NSW); Dalrymple Nature Reserve, Pymble, *M.J.Taylor 115*, 9.xi.1983 (BRI, MEL676322, NSW); Tarougra Forest Road, 2 km E of Bodalla along Potato Point Road, *E.Mullins 696*, 6.x.1986 (CANB, MEL714731); Duckhole Rd, c. 1.7 km S of its intersection with the final 5 km track to Saltwater Creek Camping Ground, *D.E.Albrecht 781*, 18.ix.1984 (MEL674058); Montreal, Wallaga Lake Rd, corner of track to Camel Rock, *N.Schultz 112*, 3.ix.1994 (MEL2191152, NSW); Track to Mt Imlay, c. 20 km SW of Eden, *R.Coveny 5795 & J.Armstrong*, 15.x.1974 (AD, BRI,

CANB, MEL602810, NSW, PERTH). **VICTORIA**: 5.5 km WNW of Gelliondale PO, 12 km WSW of Yarram PO, *A.C.Beauglehole 62463*, 11.xii.1978 (MEL1S0818S); Chessum Rd, 0.7 km W from junction with Limestone Quarry Rd, Holey Plains State Park, *M.G.Corrick 9986 & B.J.Conn*, 14.x.1986 (CANB, MEL685997, NSW); Cicada Trail, Mueller R., E side, Croajingolong National Park, *A.J.Whalen 669 & D.Mallinson*, 10.x.2002 (CANB, MEL2271193); Princes Hwy, c. 6 km E of Cann R., *T.B.Muir 1934*, 26.xi.1960 (MEL602809); 14 km S of Tarwin Lower on road to Walkerville, West Gippsland, *I.R.Thompson 1161*, 10.x.2009 (AD, BRI, HO, MEL). **TASMANIA**: c. 25 km N of Launceston, *R.Gunn 1016*, 21.x.1842 (NSW); S side of Croppies Point Rd, *A.M.Buchanan 1745*, 24.xi.1983 (HO); SW side of Mt Andrew, *P.Collier 969*, 3.xi.1985 (HO); Road W to Eagle Hawk Tier, NW of Nunamara, *A.V.Ratkowsky*, 16.xi.1991 (HO); N of Priory, *A.M.Buchanan 14916*, 19.xi.1997 (HO).

***Flowering period***: Flowers spring.

***Distribution and habitat***: Occurs in far eastern New South Wales S from Urunga in the north-east of the state, in south-eastern Victoria as far west as Walkerville, and in north-eastern Tasmania (Fig. 3). Grows in open forest.

***Notes***: *Platylobium parviflorum* can generally be identified when sterile by the high length to width ratio and more spreading secondary venation of leaves. Leaves are not cordate at the base, whereas this feature is common in *P. formosum*, *P. reflexum* and *P. montanum* subsp. *montanum*. A typical leaf is shown in figure 1b. The indistinct petiole-petiolule articulation (Fig. 1c) sets it apart from all species except *P. formosum* and *P. triangulare*. The flowers of *P. parviflorum* is of similar size to those of *P. montanum*, but the standard is generally less extensively marked purple-red on its abaxial surface. *Platylobium parviflorum* tends to have a broader pod-wing and a shorter stipe than *P. montanum*.

In the Mt Imlay area in far south-eastern New South Wales (eg. *R.Coveny* 5795, AD, BRI, CANB, MEL, NSW, PERTH; *M.Crisp 4591*, CANB, NSW) leaves are quite narrow and have an unusually high length:width ratio.

The rust fungus *Aecidium* has been noted on pods of this species, eg. *Muir 1934* (MEL). Infection of pods by species of *Aecidium* is also seen in other genera of the Bossiaeeae, including *Bossiaea* and *Goodia*.

### 5. *Platylobium montanum* I.Thomps., *sp. nov.*

*A P. formoso Sm. foliis manifeste unifoliolatis, petiolo longiore plerumque, squamis et bracteis longioribus glabris, calyce breviore, stipite leguminis calyce excedens, ala leguminis angustiore differt.*

***Type***: Victoria. Wabonga Plateau State Park, 10 km south of Whitfield, *A.D.J.Piesse 370*, 1.x.1986; holotype: MEL685291.

*Weakly erect, sprawling or prostrate shrubs*, to c. 1.5 m high, or to c. 2 m if supported. *Stipules* 3–5 mm long, 1–2.5 mm wide. *Leaves* commonly all opposite, sometimes a proportion alternate; petiole 2–12 mm long; petiole-petiolule articulation distinct; lamina broad-ovate to ovate, to c. 50 mm long, to c. 40 mm wide, with l:w ratio 1–1.8(–2); baso-lateral points not developed; base often cordate to deeply cordate, occasionally truncate or broadly rounded; margin nearly flat to slightly revolute; apex subacute to narrowly acute, with apiculum to c. 2 mm long, often spine-like, not pungent; upper surface commonly moderately tuberculate, secondary veins angled forward at c. 45° at widest part of leaf; lower surface glabrescent; midrib c. 0.5 mm wide. *Inflorescences* 1–4 per axil; scales up to 14, glabrous except for margins; scale-bract cluster 4–10 mm long, occasionally bract and distalmost scale separated by up to 10 mm from cluster; bract 3–6 mm long; pedicel 5–25 mm long; bracteoles inserted 1–7 mm below receptacle, 4–10 mm long, (1.5–)2–4 mm wide (flattened), convex throughout, not reflexing, or occasionally slightly reflexed at the tip, striations obscure or distinct, glabrous or with medial hairs or rarely hairy all over, brown to red-brown. *Calyx* 5–8(–10) mm long, with a scattered or more often dense indumentum of appressed hairs; upper lobes 3–6 mm long, 3–7 mm wide; lower lobes 1–2.5 mm long; standard 10–15 mm long, 12–22 mm wide, with claw 2.5–3.5 mm long; abaxial surface purple-brown throughout or with narrow yellow bands at sides; wings 9–11 mm long, 3–5 mm wide, yellow, sometimes patchily marked red; keel 9–10 mm long, 4–6 mm wide; style 4–5 mm long. *Pods*: stipe (7–)10–15(–20) mm long; body 15–40 mm long, 8–13(–17) mm wide including wing 1–2(–3) mm wide, dark brown or grey-brown, mostly up to 6-seeded; sutures hairy or rarely glabrous; valves with scattered hairs all over, or occasionally with hairs restricted to seed zone or glabrous; funicles c. 1 mm long. *Seeds* 2.5–3.5 mm long, 1.8–2.5 mm wide, mid or dark brown, sometimes speckled; aril 1.5 mm long, c. 1 mm high, with base c. 1.2 mm long; lobe overhanging base.

**Key to subspecies of *Platylobium montanum***

1 Plants weakly erect or sprawling, not covering large areas; flowering and fruiting consistently occurring (petiole generally < 1/5 of lamina length; lamina commonly moderately to deeply cordate) ..... **5a.** subsp. ***montanum***

1: Plants prostrate, covering large areas; flowering sporadic and fruit development rare (petiole usually ≥ c. 1/5 of lamina length; lamina rounded to shallowly cordate) ..... **5b.** subsp. ***prostratum***

***Etymology***: The epithet refers to the occurrence of this species on mountain ranges of the Great Divide of south-eastern Australia (From Latin: *montanus*, of mountains).

***Notes***: There are two subspecies.

## 5a. *Platylobium montanum* subsp. *montanum*

*Weakly erect or sprawling shrubs*, not rooting at nodes, not covering large areas. *Leaves* generally all opposite; petiole mostly 2–5 mm long, occasionally to c. 8 mm long in a small proportion of leaves; base of lamina mostly shallowly to deeply cordate, less often truncate or rounded. *Pedicels* 5–15(–20) mm long; bracteoles inserted 0.5–2 mm below receptacle. *Flowers* usually abundant each season; calyx 5–7 mm long, with upper lobes 3–5 mm wide; lower lobes 1–1.8 mm long. *Pods* usually several to many on a plant. (See species description for information on pods and seeds.)

***Selected specimens of c. 160 examined***: **NEW SOUTH WALES:** Gulf Stream, Winburndale Nature Reserve, 20 km E of Bathurst, *R.Coveny 9621*, 2.x.1977 (NSW); Rydal, c. 8 km W of Lithgow, *A.Morris*, 14.x.1924 (AD, N5W); Along Junction Pt Rd, 1.9 km N of its junction with the Bigga to Binda Rd, *R.J.Bayer NSW-98054*, 4.x.199B (CANB); Two Sticks Rd near A.C.T. border, *M.Groy 5759*, xi.1965 (CANB, MEL); 6.B km E of Khancoban PO on the Alpine Way to Thredbo, *B.Archer 500*, 23.xii.1996 (CANB, MEL2036310, NSW); Batlow, *J.Boormon*, x.1916 (BRI, N5W); W of and close to Princes Hwy near Narrabarba, *A.Lee*, i.1974 (N5W); Minjary National Park, 3.3 km SSE of Minjary Mountain and c. 9 km NW of Tumut, *I.Crawford 6758*, 9.xi.2001 (CANB, N5W). **AUSTRALIAN CAPITAL TERRITORY:** 12 km W of Condor Creek crossing on Brindabella Rd, *G.Stewart 223 & B.O'Shea*, 1B.x.1984 (CANB); Near Blundells Flat, 3 km 5 of Mt Coree, *B.J.Lepschi 110*, 26.ii.19B9 (CANB). **VICTORIA:** Lake Mountain, *D.B.Foremon 1042 & R.Filson*, 1S.x.1985 (CANB, MEL1546273, NSW); S river bank at Bundara R. bridge, 31.5 km NW of Omeo on Omeo–Mitta Mitta Rd, *J.H.Ross 3423*, 2B.x.1990 (AD, BRI, CANB, HO, N5W); Road down from Falls Creek, c. 15 km from Omeo Road, *J.D.M.Pearson*, 20.xi.1966 (MEL574935); King Spur Track, c. 3B km N of Dargo, *R.A.Kilgour 196*, 1.ii.19B2 (MEL603359); Intersection of Freestone Ck Rd and Ten Mile Track, 3 km WNW of Moornapa Fire Tower, *R.A.Kilgour 327*, 25.x.1982 (MEL629410); Mt Oberon car park, Wilsons Promontory, *M.G.Corrick 7090*, 7.xi.19B0 (MEL576034); 0.7 km 5 of Kinglake, *H.I.Aston 347*, 2B.ix.1959 (MEL602838); c. 11 km N of Mt Victory Rd, Mt Difficult Range, Grampians National Park, *A.C.Beouglehole 30923*, B.ix.1969 (MEL602B22, NSW); Dearden Track, 5W of Taradale, *I.R.Thompson 1165*, 13.x.2009 (CANB, MEL, N5W); Melba Hwy, Ronans Well, between Dom Dom picnic ground and Black Spur, *I.R.Thompson 1216*, 4.i.2010 (MEL).

***Flowering period***: Flowers spring.

***Distribution and habitat***: Occurs along the Great Divide in south-eastern New South Wales, south from Orange, the Australian Capital Territory and Victoria. In Victoria it extends as far west as Taradale in south-central Victoria with somewhat disjunct occurrences further west in the Grampians Ranges and further south in Wilsons Promontory (Fig. 3).

***Notes***: *Platylobium montanum* subsp. *montanum* commonly has leaflet-laminas with a pronounced cordate base and short petioles, which has the effect of making the leaves appear more or less sessile (Fig. 4a). Bracteoles of *P. montanum* are convex and typically quite long relative to the length of the somewhat silky calyx (Fig. 4b). At locations between Castlemaine and Malmsbury in south-central Victoria (eg. *I.R.Thompson 1165* MEL, *Mueller* MEL), bracteoles are shorter than usual and also unusually are hairy all over.

Pods are commonly covered with hairs, and the hair density is relatively high, such that early in development the surface is completely obscured by white appressed hairs. However, in the Southern Tablelands of New South Wales, eg. around Tumut (eg. *Crawford 6758* CANB, NSW), pod valves are sometimes hairless. Also in some of these populations the pods and pod-wings are unusually broad.

*Platylobium parviflorum* is perhaps closest to *P. montanum* subsp. *montanum* in bract, bracteole and floral morphology. Apart from the difference in the structure of the petiole-petiolule articulation, *P. montanum* subsp. *montanum* differs from *P. parviflorum* in having leaflets with a lower length:width ratio and

a cordate base, scales, bracts and bracteoles that are typically longer and less distinctly striate, calyces with a denser indumentum, and the abaxial surface of the standard more extensively marked with red.

*Platylobium montanum* subsp. *montanum* is distinguishable from subsp. *prostratum* by its more erect habit. The two subspecies have been seen growing together near Taradale in south-central Victoria and were readily distinguished by both habit and leaf morphology at that site. Some specimens collected from where the two subspecies overlap in distribution are difficult to place to subspecies level, which raises the possibility that these specimens are hybrids. Leaf morphology of the two subspecies is shown in Figure 4.

### 5b. *Platylobium montanum* subsp. *prostratum* I.Thomps., *subsp. nov.*

A subspecie typica plantis prostratis raro fertilis, petiolo longiore, foliis minus valde cordatis differt.

***Type***: Victoria. Mt Slide Rd between Yarra Glen and Kinglake, north of Greenwood Lane, *M.G.Corrick 10212*, 4.x.1986; holotype: MEL; isotype: CANB.

*Prostrate shrubs*, rooting at nodes, covering large areas. *Leaves* all opposite or with a proportion of leaves alternate; petiole 3–15 mm long; base of lamina shallowly cordate, truncate or rounded. *Pedicels* 15–25 mm long; bracteoles inserted 1–7 mm below receptacle. *Flowering* apparently unreliable and plants generally not very floriferous; calyx 6–10 mm long, with upper lobes 4–7 mm wide; lower lobes 1.5–2.5 mm long. *Pods* rarely developed; stipe 8–10 mm long; body 20–25 mm long, 12–14 mm wide, including wing c. 1 mm wide, grey-brown, up to 3-seeded; sutures hairy, valves with scattered hairs. *Seeds* 3.2 mm long, 2.2 mm wide, dark brown; aril 1.5 mm long, c. 1 mm high, with base c. 1.2 mm long; lobe not overhanging base. (Pod and seed data based on *Thompson 1384* MEL.)

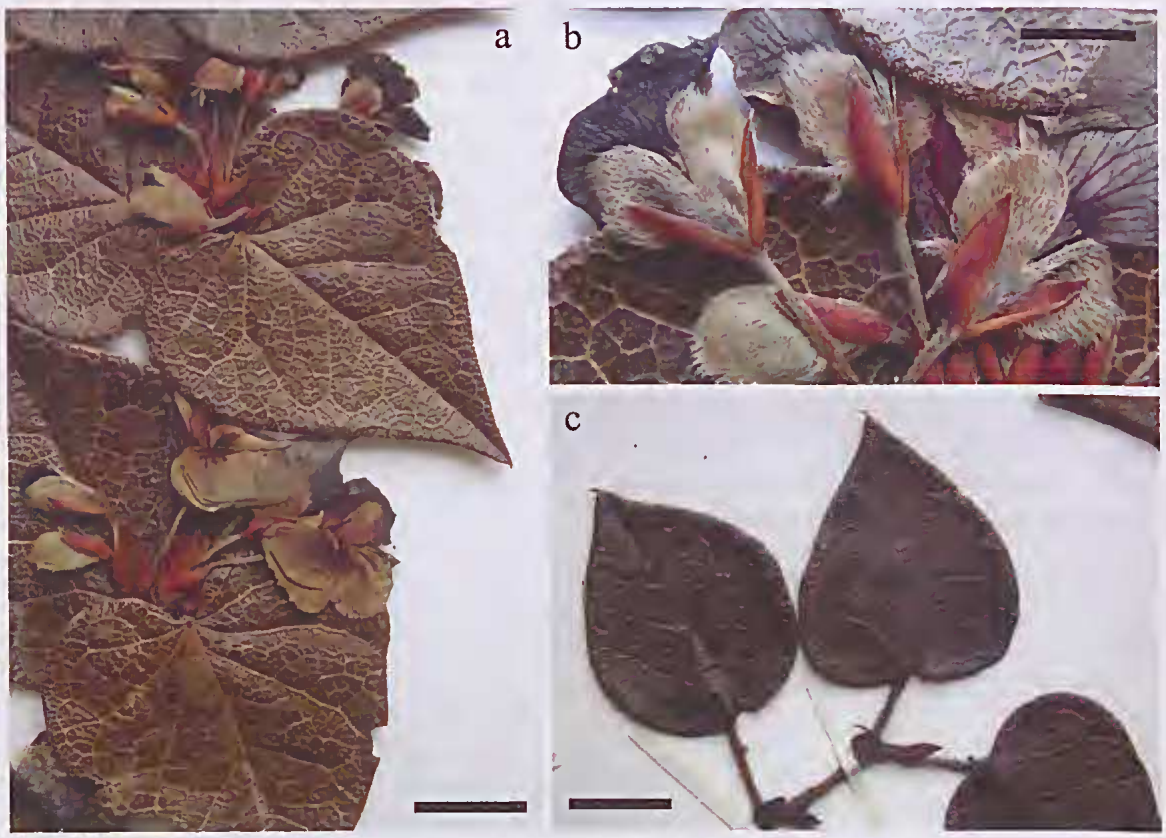


**Figure 4.** *Platylobium montanum* subsp. *montanum*. a. Leaves and inflorescences; b. flowers and bracteoles (a & b *A.D.J.Piesse 370* MEL); c. *P. montanum* subsp. *prostratum*, leaves (*H.B.Williamson*, 1915 MEL). Scale bars: a & c = 10 mm, b = 5 mm.

***Selected specimens of c. 20 examined*: VICTORIA:** Mt Cole, *H.B.Williomson*, xi.1915 (MEL, NSW); Cypress Drive, c. 1.5 km NW of Taradale, *I.R.Thompson 1384*, 21.xii.2010 (CAN8, MEL); Antonios Track, 4 km WSW of Taradale, *E.E.Perkins s.n.*, 30.xi.2008 (MEL); 4 km S of Gisborne beside Hobbs Rd, *T.B.Muir 4989*, 6.x.1971 (MEL); Near Kilmore water supply dam, Mt Disappointment, *M.G.Corrick 5680*, x.1976 (MEL547668); Kilmore, *J.W.Dwyer*, x.1918 (NSW); Nicholson-Mt Alfred State Forest, *A.C.Beauglehole 77285*, 23.ix.1984 (MEL671303); Avon-Mt Hedrick natural feature, scenic reserve, *A.C.Beauglehole 77885*, 5.x.1984 (MEL671304); 14.2 km NE of Moe, on road to Erica, *D.E.Albrecht 1874*, 25.ix.1985 (MEL); Ben Cruachan natural feature, scenic reserve, *A.C.Beauglehole 78013*, 6.x.1984 (MEL671301); 4.5 km along Collins Rd off Bruthen–Omeo Rd, road to summit of Mt Elizabeth, Mt Elizabeth no. 2 State Forest, *J.H.Ross 3202*, 14.x.1986 (AD, 8RI, CANB, HO, MEL113635, NSW).

***Flowering period*:** Flowers spring.

***Distribution and habitat*:** Occurs on the southern side of the Great Divide in southern Victoria from Mt Cole east to Buchan (Fig. 3).

***Etymology*:** The subspecific epithet refers to the habit of the plants (From Latin: *prostratus*, prostrate).

***Notes*:** *Platylobium montanum* subsp. *prostratum* resembles *P. infecundum* and *P. rotundum* in habit and leaf morphology, and in having very low fertility. Compared to *P. infecundum*, it differs in having shorter petioles, less discolorous leaves, a denser and more appressed calyx indumentum, and much broader, more convex and non-recurving bracteoles that are red-brown rather than orange-brown.

Unlike in *P. rotundum*, at least some leaves on a plant of *P. montanum* subsp. *prostratum* are opposite. Also, in the latter the leaflet apex is generally more acute, the petiole is shorter, and bracteoles are larger and mostly inserted closer to the receptacle. *Platylobium montanum* subsp. *prostratum* is in several respects intermediate in nature between *P. montanum* subsp. *montanum* and *P. rotundum*, which hints at a hybrid origin for the subspecies.

A few specimens from eastern Victoria have been identified as subsp. *prostratum*; however, field examination is desirable to confirm that they have a similar habit to the several populations seen in south-central Victoria and whether they are similarly reluctant to flower or produce fruit. Specimens from Mt Elizabeth No. 2 north of Bairnsdale have leaves with a relatively long lamina and so the ratio of lamina length to petiole length is higher than is typical for subsp. *prostratum*.

## 6. *Platylobium reflexum* I.Thomps., *sp. nov.*

*A* P. formoso *Sm. foliis manifeste unifoliolatis, squamis glabris, bracteolis lanceolatis, calyce breviore, ala leguminis angustiore, seminibus minoribus differt; a* P. montano *I.Thomps. petiolo breviore, bracteolis reflexis aurantico-brunneis, stipite leguminis breviore differt.*

***Type*:** Victoria. Gembrook–Launching Place Rd, opposite Swallowfield Rd, c. 5 km NNE of Gembrook, *I.R.Thompson 1108*, 6.xi.2008; holotype: MEL; isotype: CANB.

*P. formosum* var. *cordifolium* Wawra, *Itinera Principum S. Coburgi* 1: 11 (1883). ***Type*:** Victoria. Dandenong, *Wawra coll. 1 587*, date unknown; holo: W, image seen MEL.

*Weakly erect shrubs*, to c. 1 m high, or to c. 2 m high when supported. *Stipules* 3–6 mm long, 1.5–2.5 mm wide. *Leaves* predominantly opposite, occasionally a proportion alternate; petiole mostly 1–3 mm long, occasionally proximal leaves with petiole up to c. 8 mm long; petiole-petiolule articulation mostly distinct; lamina ovate, to c. 60 mm long, to c. 40 mm wide, with l:w ratio mostly 1.2–1.8; baso-lateral points not developed; base cordate to truncate; margin recurved; apex acute, with apiculum to c. 1 mm long, spine-like but not pungent; upper surface smooth or minutely tuberculate; secondary veins angled forwards at 30–45° at widest part of leaf; lower surface glabrescent; midrib 0.5–0.7 mm wide. *Inflorescences* 1–4 per axil; scales 6–10, glabrous, scale-bract cluster 8–10 mm long, or occasionally distal-most scale separated by up to c. 5 mm from cluster; bract 4–5 mm long; pedicel 10–35 mm long, with spreading or appressed hairs 0.5–1 mm long; bracteoles inserted c. 1 mm below receptacle, 3–7 mm long, (1–)1.5–2.5 mm wide, ±flat in distal half, commonly becoming reflexed at or after flowering, distinctly striate, glabrous, or uncommonly with medial hairs, orange-brown. *Calyx* (5–)6–8 mm long, with a sparse to scattered indumentum of appressed to spreading hairs, occasionally glabrescent; upper lobes 3.5–6 mm long, 3.5–5 mm wide; lower lobes 1.5–2 mm long; standard 10–15 mm long, 15–25 mm wide, with claw 2.5–3 mm long; abaxial surface purple-brown throughout or yellow at sides; wings 10–12 mm long, 4–5 mm wide, entirely yellow; keel 9–11 mm long, 4–5 mm wide; style 4–6 mm long. *Pods*: stipe 5–11 mm long;

body 20–40 mm long, 8–12 mm wide, including wing 0.6–2 mm wide, dark grey, mostly 3–8-seeded; sutures hairy, valves with sparse to scattered long spreading hairs concentrated medially; funicles c. 1 mm long. *Seeds* 2.5–3 mm long, 1.5–1.8 mm wide, mid to dark brown or blackish, sometimes speckled; aril 1.5 mm long, c. 1 mm high, with base 1.2 mm long; lobe not or slightly overhanging base.

***Selected specimens of c. 50 examined*: VICTORIA**: Tarago Rd, 5.3 km W of Tarago River Crossing, 7 km WNW of Neerim, *N.G.Walsh s.n.*, 3.ix.1983 (MEL644429); c. 16 km from Noojee toward Powelltown, *E.J.Carroll*, 20.xii.1965 (CANB); Dandenong, *C.Walter*, no date (NSW); Launching Place, *K.Cowle*, no date (MEL); SW of Powelltown on Torbert Rd, just W of its junction with Gilderoy Rd, *M.G.Corrick 8633*, 22.ix.1983 (MEL644969); Intersection of Gembrook Rd and Mt Eirene Rd, c. 3 km S of Gembrook, *I.R.Thompson 1132*, 20.xii.2008 (CANB, MEL); Chapple Vale–Lavers Hill Rd c. 4.5 km SE of turnoff from Chapple Vale–Kennedys Creek Rd, *I.C.Clarke 2157*, 1.xii.1992 (BRI, CANB, MEL2017973); c. 6 km S of Lavers Hill on road to Glen Aire, *B.G.Briggs 2965*, 23.x.1969 (NSW); Between Lavers Hill and Apollo Bay, *D.J.E.Whibley 84*, 22.x.1957 (AD).

***Flowering period*:** Flowers spring.

***Distribution and habitat*:** Occurs in the Otway Ranges in south-western Victoria and between the Dandenong Ranges and Fumina in south-central Victoria where locally very common (Fig. 6). A specimen at AD (*E.Ashby*, xi.1937) with a few flowers and a single pod is labelled as occurring in the Grampians. Although this locality is feasible, the labelling is considered to be in error unless evidence of the existence of the species in the Grampians is confirmed. The appressed indumentum of pedicels and calyx of this specimen is suggestive of the Otway Ranges form of *P. reflexum*. Grows in tall open forest.

***Etymology*:** The epithet refers to the bracteoles which are commonly conspicuously reflexed (From Latin: *reflexus*, reflexed).

***Notes*:** The shape of the leaflet-lamina of *P. reflexum* is similar to that of *P. formosum* but its leaves can be distinguished from the latter by the presence of a distinct ridge at the petiole-petiolule articulation (Fig. 1b). *Platylobium montanum* subsp. *montanum* has similar leaf morphology and the two species can be difficult to distinguish in the absence of reproductive structures. In *P. montanum* subsp. *montanum* the petiole is generally slightly longer and the leaf-base is more deeply cordate but these features will not consistently distinguish the two taxa. Bracteoles of *P. reflexum* have a distinct herbaceous patch at the base and this is another way in which this species differs from *P. montanum*. A typical example of the reflexed bracteoles of *P. reflexum* is shown in figure 2a. *Platylobium infecundum* q.v. has similarly shaped and reflexed bracteoles except that they are generally significantly smaller. Reflexed bracteoles also occur variably in *P. formosum* and *P. triangulare*; however, because of their smaller size and lower length:width ratio, the feature is less conspicuous.

Plants in the Otway Ranges in south-western Victoria have an indumentum of short appressed hairs on the pedicels and calyces, whereas in south-central Victoria hairs on these structures are almost always long and spreading.

### 7. *Platylobium infecundum* I.Thomps., *sp. nov.*

*A* P. reflexo *I.Thomps. foliis saepe alternis, petiolo longiore, bracteolis minoribus differt; a* P. montano *I.Thomps. petiolo longiore plerumque, pilis longioribus, pedicellis longioribus, bracteolis minoribus recurvatis differt.*

***Type*:** Victoria. H.E. Parker Reserve, Heathmont, *I.R.Thompson 1104*, 4.x.2008; holotype: MEL.

*Prostrate shrubs*, rooting at nodes. *Stipules* 3–6 mm long, 1.5–2.5 mm wide. *Leaves* alternate and opposite in various proportions; petiole (2–)5–25 mm long; petiole-petiolule articulation distinct; lamina broad-ovate, triangular-ovate or rotund, mostly to c. 40 mm long, to c. 40 mm wide, with l:w ratio 0.9–1.6; baso-lateral points not developed; base mostly slightly cordate to truncate; margin mostly flat to slightly recurved, sometimes revolute; apex rounded to subacute or occasionally acute, with apiculum to c. 1 mm long, not pungent, mostly brittle; upper surface mildly tuberculate; secondary veins angled forward at 30–45° at widest part of leaf; lower surface glabrescent; midrib c. 0.4 mm wide. *Inflorescences* 1–3 per axil; scales 6–10, glabrous; scale-bract cluster 5–6 mm long, or occasionally with distalmost scale inserted several mm from cluster; bract 3–5 mm long; pedicels mostly 15–40 mm long; bracteoles inserted 0.5–5 mm below receptacle, 2–5 mm long, 0.8–1.5 mm wide, ±flat, mostly

becoming reflexed, striate, glabrous or with a few midline hairs, orange-brown. *Calyx* 5.5–9 mm long, with a sparse to scattered indumentum of long, spreading or occasionally appressed hairs; upper lobes 4–6 mm long, 3–4.5 mm wide; lower lobes 0.8–1.5 mm long; standard 10–13 mm long, 15–20 mm wide, with claw 2.5–3 mm long; abaxial surface purple-brown throughout; wings 10–12 mm long, 3–4 mm wide, sometimes marked red; keel 9 mm long, 5 mm wide; style 4–5 mm long. *Pods* (a single immature pod recorded for the species): stipe 7 mm long; body 20 mm long, 12 mm wide, including wing 1.2 mm wide; sutures hairy, valves very sparsely hairy with long spreading hairs. *Mature seeds* not seen.

***Selected specimens of c. 25 examined*: VICTORIA:** Courtney's Road, Belgrave South, *I.R.Thompson 1362*, 4.xii.2010 (MEL); Boronia, near railway line, NW of town, *T.B.Muir 478*, 28.ix.1958 (MEL602815); Sassafras, *P.R.H.St. John*, 6.x.1900 (MEL559320); Former Lilydale-Warburton Railway line 20 m E of intersection with York Road,.*D.J. van Bockel 49*, 12.x.1987 (MEL1588804); Ringwood, *A.Morrison*, 24.ix.1895 (CANB); Ferntree Gully, *C.Davis*, 8.xi.1942 (NSW); Maroondah Hwy, c. 5 km NE of Healesville, *I.R.Thompson 1366*, 11.xii.2010 (MEL); Healesville to Black Spur, *A.Meebold 2015*, xii.1928 (AD); Lysterfield, *A.Morris*, 3.x.1925 (AD).

***Flowering period*:** Flowers spring to mid-summer.

***Distribution and habitat*:** Occurs in the outer eastern suburbs of Melbourne, and near Healesville in south-central Victoria (Fig. 6). Currently known from four localities. Grows in open forest.

***Etymology*:** The epithet refers to the paucity of fruit and seed development in this species (From Latin: *in-*, not and *fecundus*, fertile).

***Notes*:** There had been no records of pod development in this species until recently when a single plant bearing a semi-mature pod was discovered in South Belgrave (*Thompson 1394* MEL). *Platylobium infecundum* is perhaps most closely related to *P. reflexum* based on similarities in indumentum and bracteole morphology. The hairs on pedicels and calyces are commonly relatively sparse but long and spreading. Bracteoles, although markedly smaller, are a similar shape and colour to those of *P. reflexum* and they become reflexed similarly. In terms of habit and petiole length, *P. infecundum* is more similar to *P. montanum* subsp. *prostratum* and *P. rotundum*. Although *P. reflexum* occurs in areas close to *P. infecundum*, the two species have not been recorded growing together. *Platylobium reflexum* grows in taller forests and at slightly higher altitudes than *P. infecundum*.

**Figure 5.** *Plotylobium rotundum* (*I.R.Thompson 1164* HO).

**8. *Platylobium rotundum* I.Thomps., *sp. nov.***

*A P. formoso Sm. plantis prostratis, foliis alternis, pedicellis longioribus, bracteolis insertis plus proximalis differt; a P. alternifolio F.Muell. petiolo longiore, squamis fasciculatis, calyce hirsuto, pedicello longiore differt.*

***Type***: Victoria. Swankey Gully Track, 3.7 km W of Malmsbury, *I.R.Thompson 1164*, 13.x.2009; holotype: MEL; isotype: CANB, HO.

*Prostrate shrubs*, rooting at nodes, sometimes forming extensive mats. *Stipules* 2–3 mm long, 1–1.5 mm wide. *Leaves* alternate; petiole 8–25 mm long; petiole-petiolule articulation distinct; lamina broad-ovate, broad-elliptic or c. circular, 10–40 mm long, 8–35 mm wide, with l:w ratio mostly 1–1.3; baso-lateral points absent; base broadly rounded or truncate, less often slightly cordate; margin ±flat; apex subacute or more often obtuse to rounded, with apiculum to c. 1 mm long, generally brittle; upper surface variably tuberculate, secondary veins angled forwards at 30–45° at widest part of leaf; lower surface glabrescent; midrib c. 0.4 mm wide. *Inflorescences* 1 or 2 per axil; scales 8–14, glabrous; scale-bract cluster 3–6 mm long, sometimes distalmost scale inserted several mm distal to cluster; bract 2–6 mm long; pedicel (10–)20–50 mm long; bracteoles inserted c. in middle third of pedicel, 5–30 mm below receptacle,

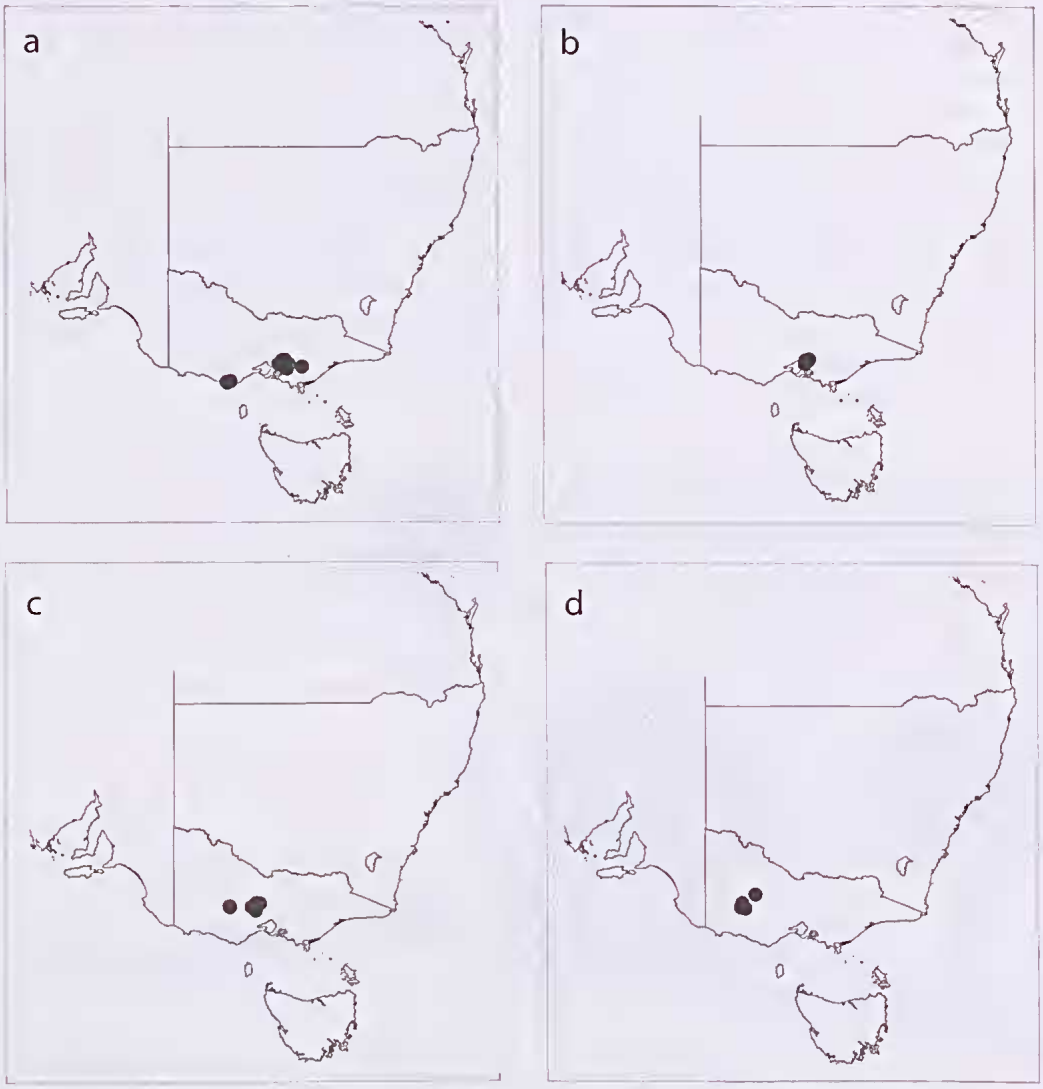


**Figure 6.** Distributions of a. *Platylobium reflexum*, b. *P. infecundum*, c. *P. rotundum*, and d. *P. alternifolium*.

2–6 mm long, 1–2 mm wide, flat or convex, sometimes reflexing, striate, glabrous or patchily hairy, brown or orange-brown. *Calyx* 5–6 mm long, with a fairly sparsely indumentum of appressed hairs; upper lobes 3.5–5 mm long, 3–4 mm wide; lower lobes 1.5–2.5 mm long; standard 12 mm long, 18 mm wide, with claw c. 3 mm long; abaxial surface purple-brown throughout; wings 8–12 mm long, 4–5(–6) mm wide, yellow, commonly with red markings; keel 7–10 mm long, 5–6 mm wide; style 4–5 mm long. *Pods*: stipe 7–12 mm long; body 10–16 mm long, 8–10 mm wide including wing 0.8–1 mm wide, purplish-brown, 1-seeded (very few seen); sutures hairy, valves glabrous or with scattered long hairs in zone overlying seeds; funicles 1.5 mm long. *Seeds* 3 mm long, 2 mm wide, dark brown; aril 1.2 mm long, 0.8 mm high, with base 1.2 mm long; lobe not overhanging.

***Selected specimens of c. 12 examined*: VICTORIA:** Mt Buangor, c. 27 km E of Ararat PO, *A.C.Beauglehole 61357*, 5.xi.1978 (MEL649738); Humboldt [track] off Swankey Gulley Track, 3.7 km W of Malmsbury, *E.Perkins*, 30.xi.2008; 1.4 km E of Malmsbury Railway Station, *E.E.Perkins*, 10.x.1991 (MEL); Hepburn Golf Links, *F.Robbins*, xi.1945 (MEL2093292); Ben Nevis, *C.Green* (MEL569727); Walking track, near Cave Hill, Mt Buangor State Forest, *I.R.Thompson 1169*, 2.xi.2009 (AD, BRI, HO, CANB, MEL); Newbury, *H.B.Williamson*, xi.1915 (NSW).

***Flowering period*:** Flowers spring.

***Distribution and habitat*:** Occurs in central and central-west Victoria from Mt Buangor east to Blackwood (Fig. 6). Grows in open forest.

***Etymology*:** The epithet refers to the shape of the leaflet-lamina (From Latin: *rotundus*, nearly circular).

***Notes*:** *Platylobium rotundum* is a distinctive species recognisable by its prostrate habit, entirely alternate, long-petiolate leaves, very long pedicels and the bracteoles inserted remotely from the calyx. The often almost circular lamina of the leaflet is also reasonably distinctive. *Platylobium alternifolium* is the only other species to have entirely alternate leaves. *Platylobium rotundum* rarely produces fruit, and the descriptions of pods and seeds are based on two separate collections from near Malmsbury, in south-central Victoria, the only locality where these have been collected.

Examination of fresh material has shown that stamen-filaments of *P. rotundum* are purple, unlike the white filaments seen in other species. An image of a pressed specimen of *P. rotundum* is presented in figure 5.

### 9. *Platylobium alternifolium* F.Muell., *S. Sci. Rec.* 3: 99 (1883)

***Type*:** Victoria. Mt William, *D.Sullivan*, 1883; lectotype: MEL569729, *fide* J.H.Ross, *Muelleria* 5(2): 129 (1983).

[Residual syntypes: Mt William, *D.Sullivan*, 1882 (MEL569728) = *P. alternifolium*; Mt Disappointment, *F.Mueller*, 1852 (MEL) = *P. montanum* subsp. *prostratum*; Mt Ben Nevis, *C.Green*, date unknown (MEL) = *P. rotundum*]

*Prostrate shrubs*, rooting at nodes, often forming extensive mats. *Stipules* 2–3 mm long, 1–2 mm wide. *Leaves* alternate; petiole 5–15 mm long; petiole-petiolule articulation distinct; lamina ovate or triangular-ovate, 10–30 mm long, 10–25 mm wide, with l:w ratio mostly 1–1.5; baso-lateral points absent; base mostly cordate to deeply cordate, occasionally c. truncate; margin flat to slightly recurved; apex obtuse to acute, with apiculum to c. 0.5 mm long, not pungent; upper surface smooth or tuberculate, secondary veins angled forwards at 15–30° at widest part of leaf; lower surface glabrescent; midrib c. 0.4 mm wide. *Inflorescences* mostly 1 per axil; scales 6–10, glabrous, inserted at intervals along axis, rather than forming a cluster; bract 4–5 mm long, inserted up to c. 1 mm from base of pedicel; pedicel 4–8 mm long, glabrous; bracteoles inserted 2–5 mm below receptacle, 5–7 mm long, 2–3 mm wide, strongly convex, not reflexing, usually striate, glabrous, sometimes pale or pinkish. *Calyx* 7–8 mm long, glabrous except for marginal cilia; upper lobes 4.5–6 mm long, 3–4 mm wide; lower lobes 0.8–1.5 mm long; standard 12–14 mm long, 14–18 mm wide, with claw c. 3 mm long; abaxial surface purple-brown throughout or nearly so; wings 9–11 mm long, c. 3 mm wide, sometimes marked red; keel 9–10 mm long, 4–5 mm wide; style 4–5 mm long. *Pods*: stipe 2–3 mm long; body 15–20 mm long, 10 mm wide, including wing 1–1.5 mm wide, dark brown or grey-brown, up to 6-seeded; sutures hairy, valves glabrous; funicles c. 1 mm long. *Seeds* (few seen) 3 mm long, 2 mm wide, pale or dark brown; aril c. 1 mm long, c. 1 mm high, with base c. 1 mm long; lobe not overhanging base.

***Selected specimens of c. 15 examined*: VICTORIA:** c. 4 km S along Mt Difficult Rd from junction with East Wartook Track, *J.V.Yugovic 241*, 31.x.1985 (MEL680261); Mt Difficult Range [East], *A.C.Beauglehole 30754*, 2.vi.1979 (MEL99431); c. 0.8 km down road from

lookout over Treefern Gorge, NW of summit of Mt William, *A.C.Beauglehole 30405A*, 31.i.1969 (MEL99436); Bolangum Ranges, *J.W.Audax*, xi.1920 (MEL); Mt Difficult Rd, Grampians, *M.E.Phillips s.n.*, 12.x.1966 (CANB).

***Flowering period***: Flowers spring.

***Distribution and habitat***: Occurs in the Grampians Ranges and nearby Bolangum Ranges (a very old record) in south-western Victoria (Fig. 6). Grows in dry sclerophyll forest.

***Notes***: *Platylobium alternifolium* is a distinctive species with entirely alternate leaves, a glabrous calyx, and bud scales relatively widely spaced along an elongate axis. *Platylobium alternifolium* appears to be variable from season to season in the amount of fruit and seed development. The reticulate leaf-venation is sometimes impressed, at least in dried specimens, and this appearance has not been seen in other species. *Platylobium montanum* subsp. *prostratum* is close to *P. alternifolium* in terms of habit, leaf morphology, and bract and bracteole morphology.

### Names of uncertain application (See Ross 1983 for details)

***Platylobium gracile*** **Dum.-Cours.**, *Le Botaniste Cultivateur* 2nd edn, 7: 314 (1814).

***Platylobium rotundifolium*** **Colla**, *Hortus Ripulensis* 1: 110 (1824).

Although *Platylobium rotundum* often has circular leaves, collections of *P. rotundifolium* are not likely to have been made from where *P. rotundum* is known to occur in central Victoria.

### Excluded names

***Platylobium lanceolatum*** **Andrews**, *Bot. Repos.* 3: t. 205 (1802).

This is *Bossiaea heterophylla* Vent.

***Platylobium microphyllum*** **Sims**, in Curtis, *Bot. Mag.* 22: t. 863 (1805).

This is *Bossiaea microphyllum* (Sims) Sm.

***Platylobium obcordatum*** **Vent.**, *Jardin de la Malmaison* 1: subt. 31 (1803).

This is *Bossiaea obcordata* (Vent.) Druce.

***Platylobium ovatum*** **Andrews**, *Bot. Repos.* 4: t. 266 (1802).

This is *Bossiaea heterophylla* Vent.

***Platylobium reticulatum*** **Sieb. ex Spreng.**, *Syst. Veg.* edn 16, 3: 231 (1826).

This is *Mirbelia platylobioides* (DC.) Joy Thomps.

***Platylobium spinosum*** **Turcz.**, *Bull. Soc. Naturalistes Moscou.* 26: 284 (1853).

This is *Bossiaea spinosa* (Turcz.) Domin

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